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STRENGTHENING THE COMMITMENTS IN ARTICLE 4.2(A) AND (B)

POLICIES AND MEASURES

Note by the secretariat

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I. INTRODUCTION

A. Mandate

1. The Ad Hoc Group on the Berlin Mandate (AGBM), at its second session, requested the secretariat, drawing on national communications,* available in-depth review reports, the Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) and comments from Parties, to develop, for consideration at the third session, a document that would follow up on document FCCC/AGBM/1995/6 (see FCCC/AGBM/1995/7, para. 30).

B. Scope of the note

2. This note has been prepared in response to the above request. It seeks to assist the AGBM in its consideration of the strengthening of the commitments in Article 4.2(a) and (b) through the elaboration of policies and measures. It is structured according to the sectoral classifications used in document FCCC/AGBM/1995/6. For each sector, there is a brief review of:

(a) The relative contribution of that sector to the problem, drawn from document FCCC/SB/1996/1;

(b) An overview of the policy response by Annex I Parties, drawing on documents FCCC/AGBM/1995/6 and A/AC.237/81;

(c) An estimate of the potential to reduce emissions in the sector, as identified by the IPCC, usually on a global scale (recognizing that the potential in Annex I Parties would be more relevant but is not always available); and

(d) Potential areas for future analysis, assessment and action by the AGBM, as identified in submissions from Parties to the secretariat (including statements to the AGBM) and by the IPCC.

Cross-sectoral economic instruments are considered in a final section.

3. On this basis, a number of suggestions are offered or questions posed, bearing in mind that the purpose of the exercise is to identify policies and measures that would be elaborated in a protocol or another legal instrument. These suggestions and questions have been developed in an attempt to give effect to the conclusion reached at the second session that the range of policies and measures under consideration needs to be narrowed down, but

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* The term "national communications" includes communications from the regional economic integration organization included in Annex I to the Convention.

not closed off, and that this narrowing down exercise would have to advance at this session if the process is to remain on track to the Conference of the Parties at its third session (COP 3) (FCCC/AGBM/1995/7, para. 23).

4. The note attempts to suggest possible directions or areas of emphasis that could help the AGBM in focusing its analysis and assessment of policies and measures and in the negotiation of a protocol or another legal instrument. It does not analyse or assess policies and measures from a technical or economic perspective. Nor does it address the economic and social impacts of policies and measures. Such assessments could be advanced once the range of policies and measures has been narrowed.

5. Document FCCC/AGBM/1995/6 also included, within each sector, a series of "policy objectives". This note refers to the concept of policy objectives as a means of conceptualizing or categorizing policies and measures and as a possible bridge between the general commitment to adopt policies and take measures contained in Article 4.2 and the need to elaborate policies and measures to strengthen that commitment, as provided in the Berlin Mandate (FCCC/CP/1995/Add.1., decision 1/CP.1). The policy objectives set out in document FCCC/AGBM/1995/6 are listed by sector, in the annex to the present note.

6. In view of the importance of technology development and diffusion for reducing emissions, document FCCC/SBSTA/1996/4 and Add.1 on technology inventory and assessment is also relevant to this agenda item and may be read in conjunction with this note. The informal workshop on policies and measures, to be convened on 4 March, will also contribute to the discussion of the AGBM.

7. The discussion of policies and measures in this note is consistent with the approach to a protocol proposed by the European Community at the second session of the AGBM (see FCCC/AGBM/1995/MISC.1/Add.3, pp. 33-42). However, it is not limited to that approach.

8. The Annex I Expert Group on the UNFCCC has submitted to the secretariat a list of policies and measures for its "common action study", along with scoping papers of work being undertaken on each measure in the first tranche of policies and measures (see FCCC/AGBM/1996/MISC.1). The detailed analytical results from these studies will be made available to the AGBM as work is completed by that Expert Group.

C. Possible action by the Ad Hoc Group on the Berlin Mandate

9. If some of the suggestions regarding policies and measures for analysis and assessment, and potentially for negotiation, are found useful, they could be reflected in the conclusions of the session as guidance for further work and next steps. For example, it may be useful for the AGBM, at this session:

- To identify a number of sectors for priority attention based on the relative contribution of each sector to the problem, the projected sectoral growth in emissions, the degree of relevance of the sector for Annex I Parties in general, and/or the interest of these Parties in moving ahead in the sector;

- To agree on a provisional, balanced list of possible policies and measures, perhaps within the context of priority sectors, that merit further, more detailed attention.

10. Some of the suggestions regarding possible approaches to policies and measures could also be addressed. For example, is the concept of "policy objectives" as used in the note a useful device for organizing future work that would benefit from further study and refinement? Do some sectors lend themselves to approaches such as agreed best practice guidelines or research and development as opposed to those which may demand common policies and measures? Would further work on technology assessment be useful?

11. . The AGBM may wish to make the best possible use of the capacities of the secretariat and of other organizations to advance work in the short time available before the next session, bearing in mind that COP 2 "will be an opportunity to take stock of the overall process and to intensify the efforts to adopt a protocol or another legal instrument at COP 3" (FCCC/AGBM/1995/2, para. 19 (c)).

II. SECTORAL POLICIES AND MEASURES

A. Energy and transformation industries

12. The energy and transformation industries are the largest single source of carbon dioxide (CO_2) emissions from Annex I Parties, accounting for over one third of the total. There are, however, important differences between Parties that are explained by different fuel mixes, ownership regimes and levels of electricity imports.

13. According to document FCCC/AGBM/1995/6, Annex I Parties have begun taking action to address a number of policy objectives in this sector. More than half these Parties report measures to support research, development and implementation of renewable energy technologies. A number of Annex I Parties have also taken steps to promote new combined heat and power generation. In addition, a number of Annex I Parties report on steps to increase access to the power grid for small, independent power producers. Relatively few, however, report taking action to improve the efficiency of existing power generation, to promote least cost planning/integrated resource planning in this sector, or to address emissions from energy transmission and distribution.

14. The IPCC indicates that significant reductions in greenhouse gas emissions are possible in this sector. Working Group II concludes that deep reductions of greenhouse gas (GHG) emissions from the energy supply sector are technically possible within 50 to 100 years (WGII, Report, p. 19-3).*

15. One source of these reductions is improved efficiency in electric power generation. The IPCC states that "the efficiency of power production can be increased from the present world average of about 30 per cent to more than 60 per cent in the longer term", and notes that "the use of combined heat and power production ... offers a significant rise in fuel conversion efficiency" (WGII, Summary, p. 14). The other major potential source of reductions is fuel switching. Working Group II concludes that "in the longer term, renewable sources of energy could meet a major part of the world's demand for energy" (WGII, Summary, p. 14), while Working Group III states that governments could consider "... implementing cost-effective fuel switching measures from more to less carbon-intensive and carbon-free fuels such as renewables ..." (WGIII, Summary, p. 3).

16. Similarly, a number of the submissions by Parties to the secretariat identify improving the efficiency of electricity generation as meriting examination. Fuel switching, with emphasis on the development and promotion of renewable energy, is also highlighted by Parties. The other priorities mentioned in submissions to the secretariat include reducing fugitive emissions from fossil fuel production and promoting least cost planning.

17. The AGBM may wish to consider the most appropriate and effective policies and measures to increase the efficiency of power production. In this context, it could be useful to distinguish between the short to medium term and the longer term, especially in looking at the role of combined heat and power production and at setting the stage for capital stock turnover. Although addressed in a later section, the use of market signals and the removal of subsidies may be important in this regard.

18. A second potential area of focus for the AGBM could be approaches to accelerating uptake and promoting the development and commercialization of renewable energy. IPCC Working Group II notes that the availability, cost and penetration of technologies like renewables will strongly depend on improving market efficiency, internalizing external costs and accelerating research, development and demonstration, and providing temporary incentives for early market development of these technologies as they approach commercial

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* Documents are referred to as follows:

WGII, Report: "Report forming part of the contribution of Working Group II to the IPCC Second Assessment Report", vols. I and II.

WGII, Summary: "Summary for policymakers: Scientific and Technical Analysis of Impacts, Adaptations, and Mitigation of Climate Change" IPCC Working Group II.

WGIII, Summary: "Summary for policymakers: The Economic and Social Dimensions of Climate Change" IPCC Working Group III.

readiness (WGII, Report, p. 19-3). Policies and measures designed to encourage the use of biofuels, non-carbon fuels or less carbon-intensive fuels might also be examined.

19. A related area the AGBM may wish to address in the field of energy is research and development (R & D). For example, could international agreement be reached on energy R & D priorities? Is there potential for strengthening international cooperation in the demonstration and commercialization of renewable energy technologies? Could Parties reach agreement on guidelines for government procurement policies that would promote renewable energy?

20. Finally, the reduction of emissions from the production and distribution of fossil fuels is a promising area where some early action may be possible (for example, methane leakage/release).

B. Industry

21. Industry as an end-user of energy accounts for about one fifth of CO_2 emissions from Annex I Parties. These Parties have reported on a considerable number and diversity of policies and measures in this sector, especially in the areas of incentives for energy efficiency and renewable energy, fuel switching, voluntary agreements and information programmes.

22. The IPCC, while noting that, in most industrialized countries, industrial sector energy-related greenhouse gas emissions are expected to be stable or to decrease as a result of industrial restructuring and technological innovation, estimates "the short-term potential for energy-efficiency improvements in the manufacturing sector of major industrial countries" at 25 per cent while "the potential for greenhouse gas emission reductions is larger" (WGII, Summary, p. 14).

23. The IPCC Working Group II report concludes that:

> "Different strategies for reducing greenhouse gas emissions deserve attention, particularly fuel substitution – with increased use of lower-carbon fuels, biomass and renewable energies in industrial processing – and efficiency improvement of energy supply (e.g., cogeneration) and energy use in industrial processes, including less materials-intensive production methods and renewable feedstocks and raw materials. Implementation would be most cost-effective during normal capital stock turnover" (WGII, Report, p. 20-3).

24. A number of Parties, in their submissions, indicate that the industrial sector merits attention in the AGBM process. There is particular interest in assessing the potential for voluntary agreements to reduce CO_2 emissions in this sector. Moreover, the IPCC indicates that Governments could consider the pursuit of "voluntary programmes and negotiated agreements with industry" (WGII, Summary, p. 18).

25. The AGBM may wish to consider how best to promote further action in this sector, particularly in the light of competitiveness concerns. If voluntary agreements are of interest, the AGBM may wish to consider whether particular industrial sectors should be the subject of early action. Would there be a role for agreed guidelines for voluntary programmes to ensure active, credible and effective industry participation? Further, the AGBM could assess whether there are any industrial sectors where it makes sense to pursue voluntary programmes or negotiated agreements at an international level. If so, how could these be developed?

26. The AGBM may also wish to consider alternative policy approaches, such as the use of regulations and/or economic instruments.

C. Residential, commercial and institutional

27. The residential, commercial and institutional sector accounts for approximately one eighth of CO_2 emissions from Annex I Parties. The national communications from these Parties reveal that this sector has been an area of initial focus for policies and measures. Most of the action reported has been directed towards improving the energy efficiency of new buildings and of new appliances and equipment, with less attention paid to energy efficiency in existing buildings. IPCC Working Group II has concluded that the technical and economic potential for energy savings, and hence for CO_2 emission reductions, remains high on a global scale, many cost-effective technologies are available (WGII, Report, pp. 22-2-3).

28. In this sector, the measure most commonly identified by Parties as a focus for action is the development of energy efficiency standards for appliances and products. The same measure has also been identified by the IPCC.

29. If energy efficiency standards for products and equipment are deemed to merit further attention, the AGBM may wish to consider:

- Whether to aim at an international agreement on the principle of adopting minimum efficiency standards, on specific agreed standards, on methodological issues and testing procedures, on labelling and/or on some other approach or combination of these;

- What types of appliances, equipment or products may be most amenable to international agreement.

30. The AGBM may also wish to consider whether there are any means of increasing the exploitation of the energy-efficiency potential in existing buildings (for example, information sharing, best practice codes, innovative financing mechanisms) that could be appropriately advanced through international agreement.

31. Similarly, the AGBM could also examine means to facilitate information sharing on the construction of new energy-efficient buildings, including standards, as well as cooperative actions related to the research, development and demonstration of new energy-efficient building technologies.

D. Transportation

32. The transportation sector accounts for approximately one quarter of CO_2 emissions from Annex I Parties. For some of these Parties, the figure approaches one half of the emissions. Moreover, several Annex I Parties indicate that transportation is now one of the most rapidly growing sources of emissions. The IPCC indicates that greenhouse gas emissions from transportation have increased more rapidly on a global scale than such emissions from any other energy-using sector over the past 20 years (WGII, Summary, p. 12).

33. Annex I Parties have reported on a wide range of policies and measures that are being implemented in this sector in response to a variety of policy objectives. The most commonly-mentioned measures include fuel taxes, improved traffic management and enhanced support for public transportation. Action to improve the fuel economy of new vehicles or to develop and promote the use of alternative transportation fuels is less frequently reported.

34. IPCC Working Group II concludes that:

> "Projected energy use in 2025 could be reduced by about a third . . . through vehicles using very efficient drive-trains, light weight construction and low air resistance design, without compromising comfort and performance. Further energy use reductions are possible through the use of smaller vehicles, altered land use patterns, transport systems, mobility patterns, and lifestyles; and shifting to less energy-intensive transport modes. Greenhouse gas emissions per unit of energy could be reduced through the use of alternative fuels and electricity from renewable sources. These measures, taken together, provide the opportunity for reducing global transport emissions by as much as 40 per cent of projected emissions by 2025" (WGII, Summary, p. 14)

35. Transportation sector emissions are relevant for all Annex I Parties. The fact that emissions are expected to continue to grow rapidly in this sector, coupled with the scope for further action in many Annex I Parties, would seem to make greenhouse gas emissions from transportation a key focus for action under the Berlin Mandate. Submissions by Parties to the secretariat reflect this view.

36. IPCC Working Group II concludes that "... there is an emerging consensus that attempts to move traffic to less energy-intensive modes depend on using well-integrated strategies designed specifically for local situations ..." (WGII, Report, p. 21-2). Reducing

transportation subsidies that increase greenhouse gas emissions is also identified by the IPCC as an area where Governments could consider taking action (WGII, Summary, p. 18).

37. Several Parties indicate that approaches to reducing greenhouse gas emissions from new vehicles should be considered by the AGBM; the IPCC also notes the relevance of this area. Some form of international cooperation may be important. In this context, the AGBM may wish to explore the role of internationally-agreed standards, coordinated national standards (that take into account different starting points), voluntary agreements with vehicle manufacturers (international or national), agreement on policy objectives or aims, and/or agreement on cooperative research and development efforts. Economic instruments (for example, vehicle and/or fuel taxes) could also be used to address vehicle emissions (see section III below).

38. A broader mix of policies and measures will be necessary to limit transportation emissions, many of which can be undertaken largely at the national level. In some cases, such national action could be enhanced by international agreement to promote or advance various aspects of sustainable transportation policy (for example, with regard to public transportation, freight transportation, subsidy removal, taxes and pricing, and planning).

39. In addition, a number of Parties identify policies and measures to limit emissions from international aviation and marine bunkers as meriting attention. Such emissions account for approximately 2 to 3 per cent of CO_2 emissions for Annex I Parties, and projections indicate they are increasing. The AGBM may decide how it wishes to address this matter, recalling the roles and mandates of the subsidiary bodies and other international organizations, and the fact that such emissions are not accounted for in national greenhouse gas emission inventory totals.

E. Industrial processes

40. Industrial processes account for a small amount of CO_2 emissions from Annex I Parties but important proportions of other greenhouse gases such as N_2O, PFCs and SF_6 (for example, from production of adipic and nitric acid, nitrogen fertilizer and aluminium). However, only a limited number of Annex I Parties report having implemented policies and measures to address these emissions, albeit with some noteworthy reductions achieved. The IPCC notes that "industrial emissions of nitrous oxide and halogenated compounds tend to be concentrated in a few key sectors and tend to be easier to control. Measures to limit such emissions may be attractive for some countries" (WGIII, Summary, pp. 18-19). A number of Parties also point in their submissions and statements to the desirability of actions in this sector.

41. The AGBM may wish to assess how further action in this sector could be advanced. For example, would there be a role for national and/or international voluntary agreements with agreed sectors and, if so, what should they address? The possibilities offered by

information sharing or best practice guidelines, especially for sectors with many producers, could also be explored.

42. Emissions of HFCs may require special attention in view of the linkages to the Montreal Protocol on Substances that Deplete the Ozone Layer. Should a regulatory approach be employed (as with the Montreal Protocol) or are other approaches available?

F. Agriculture

43. The agriculture sector accounts for about one third of methane emissions and about 40 per cent of nitrous oxide emissions in Annex I Parties. For both gases, agriculture is the single largest source of these emissions in Annex I Parties as a whole. However, the national communications of Annex I Parties reveal only limited efforts to address emissions from agriculture. While a wide range of measures and instruments are being implemented to promote several policy objectives, relatively few Annex I Parties are actually undertaking any specific measure.

44. IPCC Working Group II identifies significant potential for reducing greenhouse gas emissions from agriculture on a global basis (WGII, Report, p. 23-2). Some of the key actions it singles out to reduce methane emissions from agriculture include improved nutrition of ruminant animals, altered treatment and management of animal wastes, better management of rice paddy fields and, in the case of CO_2, reduced biomass burning. Working Group II considers that the key to reducing nitrous oxide emissions from agriculture is improved agricultural management (for example, with regard to fertilizer use and tillage practices). It also points to the potential for increasing carbon sequestration in agricultural soils.

45. Given the prominence of this sector's contribution to methane and nitrous oxide emissions, the AGBM may wish to consider how action in this sector could be advanced. In particular, it may wish to explore what mechanisms would be most appropriate for a sector characterized by a large number of actors and unique management frameworks within each Party.

46. How could examples of "best practice" be shared among Parties? Could Parties reach agreement on "guidelines" for best practices that would allow for flexibility in national-level implementation, possibly in the context of agreed policy objectives (for example, regarding use of fertilizers, nutrition of ruminant animals, treatment of animal wastes, and/or tillage practices)? Is there any scope for cooperative research efforts to reduce greenhouse gas emissions from this sector?

G. Land use change and forestry

47. Figures reported in the national communications indicate that removals of CO_2 through land use change and forestry practices could be equivalent to approximately

10 per cent of CO_2 emissions in Annex I Parties. In a limited number of Parties, however, these removals could be equivalent to more than a third of national CO_2 emissions.

48. Document FCCC/AGBM/1995/6 makes it clear that many Annex I Parties are taking steps to promote afforestation of agricultural lands, abandoned lands and urban areas. In most cases, Parties are using financial incentives to pursue this objective, although some Parties are using other policy instruments as well. Fewer Parties are taking actions to improve the management of existing forests - although financial incentives are once again the primary tool being used to meet this end.

49. IPCC Working Group II indicates that there are substantial opportunities to increase the carbon sequestered in forests over the next 50 to 100 years on a global scale, although nearly all this potential is found outside Annex I Parties (WGII, Report, 24-2).

50. Few Parties mention policies and measures in this sector in their submissions to the secretariat, although improving the management of existing forests is noted. The IPCC suggests that policymakers could consider "implementing measures to enhance sinks or reservoirs of greenhouse gases such as improving forest management and land use practices" (WGIII, Summary, p. 4).

51. The AGBM may wish to consider actions to enhance sinks and/or reduce emissions in this sector, bearing in mind the work of the Intergovernmental Panel on Forests. Is agreement on shared policy objectives with respect to forest management possible? Could common goals be defined with respect to afforestation? Could Parties reach agreement on "guidelines" for best practices that would allow for flexibility in national-level implementation? Is there any scope for cooperative research efforts to reduce greenhouse gas emissions from this sector?

H. Waste management and sewage treatment

52. The waste management and sewage treatment sector accounts for approximately one quarter of CH_4 emissions in Annex I Parties. These Parties report a limited range of action in this sector. Efforts are directed primarily at promoting recycling, minimizing waste and capturing methane emissions from landfills, with less attention given to reducing emissions from sewage treatment.

53. IPCC Working Group II notes that "recent studies suggest that global methane emissions from solid-waste disposal can be reduced by about 30 per cent through the widespread use of existing technologies and practices, making both economic and environmental sense ..." (WGII, Report, p. 22-20).

54. The AGBM may wish to consider how best to address this sector. The relatively limited range of actions reported by Annex I Parties indicates that there may still be some scope for national action. How could this potentially be promoted (for example, through

agreement on policy objectives, on "best practices", on instruments such as taxes or regulations)? The AGBM may also wish to consider whether reducing methane emissions from landfills might lend itself to agreement on more precise measures or policy objectives regarding recovery practices, technology applications in particular circumstances or recycling and waste reduction.

III. CROSS-SECTORAL ECONOMIC INSTRUMENTS

55. According to document FCCC/AGBM/1995/6, a limited number of Annex I Parties report using energy, carbon or other broad-based taxes to reduce greenhouse gas emissions or taking steps to remove subsidies that lead to higher emissions, including for consumers and producers of fossil fuels. Several Parties point to the trade and competitiveness issues associated with such instruments. These instruments are also identified as instruments requiring some degree of international coordination and as priorities for analysis and assessment. In this context, Article 4.2(e), subparagraphs (i) and (ii) are relevant.

56. The IPCC discusses cross-sectoral economic instruments at some length. Working Group III notes that "at both the international and national levels, the economic literature indicates that instruments that provide economic incentives, such as taxes and tradeable quotas/permits, are likely to be more cost-effective than other approaches" (WGIII, Summary, p. 26). In a similar vein, Working Group II concludes that Governments should consider "energy pricing strategies (e.g., carbon or energy taxes, and reduced energy subsidies)" (WGII, Summary, p. 18). Working Group III also concludes that "a number of studies of this issue indicate that global emissions reductions of 4 to 18 per cent, together with increases in real incomes, are possible from phasing out fuel subsidies" (WGIII, Summary, p. 26).

57. In this light, the AGBM may wish to discuss how best to advance in its consideration of cross-sectoral economic instruments. A number of orientations may be worthy of consideration, for example:

- Common international, or coordinated national, efforts on new taxation measures and/or on removal of subsidies and market distortions

- Agreement to promote national efforts to review existing taxes and subsidies and consider possibilities to restructure these so as to reduce greenhouse gas emissions

- Agreement on some principles or a common set of market signals that Annex I Parties could implement through national actions appropriate to each Party

While further analysis and assessment would be necessary, this would most usefully be carried out if some guidance were available on the nature of the policy measures to be assessed.

58. A number of Parties have mentioned tradeable emission permits or quotas as a measure to be considered by the AGBM. While it might be possible for some preliminary conclusions on such an approach to be reached by COP 3, it would appear unlikely that a fully-developed system could be agreed by that deadline.

Annex

SECTORAL "POLICY OBJECTIVES" AS SET OUT IN DOCUMENT FCCC/AGBM/1995/6

1. ENERGY AND TRANSFORMATION INDUSTRIES

   (a) Restructuring energy markets

   (b) Existing facilities: improving energy efficiency and reducing fugitive emissions

   (c) Increasing the use of non-fossil fuel energy sources and low-carbon fossil fuels

   (d) Energy transmission and distribution

2. INDUSTRY

3. RESIDENTIAL, COMMERCIAL AND INSTITUTIONAL

   (a) Improving the energy efficiency of new buildings

   (b) Improving the energy efficiency of existing buildings

   (c) Improving the energy efficiency of appliances and equipment

4. TRANSPORTATION

   (a) Improving automobile fuel efficiency

   (b) Increasing the use of alternative transportation fuels

   (c) Strengthening vehicle emission controls

   (d) Increasing the use of alternative modes of transportation

   (e) Increasing the efficiency of freight transportation

   (f) Improving transportation and urban land use planning

5. INDUSTRIAL PROCESSES

6. AGRICULTURE

   (a) Reducing emissions from enteric fermentation in animals

   (b) Reducing emissions from animal wastes in agriculture

   (c) Reducing emissions from the use of nitrogen fertilizers

   (d) Enhancing carbon dioxide sequestration and retention in agricultural soils

   (e) Reducing methane emissions from rice production

7. LAND USE CHANGE AND FORESTRY

   (a) Preserving biomass

   (b) Afforestation and reforestation

8. WASTE MANAGEMENT AND SEWAGE TREATMENT

   (a) Promoting recycling and minimizing waste

   (b) Reducing emissions from sewage treatment

   (c) Reducing methane emissions from landfills

9. CROSS-SECTORAL ECONOMIC INSTRUMENTS